CHAPTER 28

RECEIPT, STORAGE, AND ISSUE Of BULK PETROLEUM

Section I. Bulk Petroleum Operations

HANDLING PROCEDURES

You usually receive bulk petroleum at the Class III supply point in 5,000- and 7,500-gallon tank semitrailers. You may also receive it in petroleum tank cars and through the assault hoseline. When bulk petroleum arrives at the Class III supply point, you can store it in three types of containers: 10,000-gallon collapsible tanks, 20,000-gallon collapsible tanks, and 50,000-gallon collapsible tanks. From the supply point, you can issue bulk petroleum to tank vehicles and tank cars. This chapter covers step-by-step procedures for the receipt, storage, and issue of bulk petroleum at the Class III supply point. The procedures and illustrations are based on the FSSP, but they also apply to the 50,000-gallon collapsible tank because of the similarity between the two operations. Environmental guidance is in Chapter 1 of this publication and AR 200-1.

SAFETY PRECAUTIONS

There are a number of safety precautions that you must follow when you receive, store, and issue bulk petroleum. These precautions are described below:

- HAZMAT materials for spill response must be present and available.
- Proper protective clothing and equipment must be worn by the handlers at all times during operations.
- Post NO SMOKING signs around the area of operation so that anyone working in the supply point or driving through it can see the signs immediately. Do not let anyone carry matches and lighters in the operations area. Place fire extinguishers at all receipt, storage, and issue points.
- Keep at least 25 feet between tank vehicles during receipt and issue operations. Also, keep all tractors coupled to tank semitrailers while product is being transferred so that the semitrailers can be moved quickly from the area in case of an emergency.
- Keep the canvas top and rear curtain of the tractor in place when the tank vehicle is carrying, loading, or unloading product. The curtains keep the tractor from being splashed with fuel from the vehicle catwalks.
- Keep a wooden, cone-shaped stopper handy to plug the bottom outlet of the tank car in an emergency when you load or unload a tank car. Also, ensure that all coal-burning locomotives in use near the transfer areas have smokestack and firebox screens.
- Bond and ground all vehicles and equipment before you start to receive or issue fuel.
- Stop the pump and clean the area of a spill at once. If there is a possible source of ignition, cover the area of the spill at once with sand or dry earth. If you have no source of ignition, hose down the spill and cover it with sand or dry earth. All contaminated soil must be removed and disposed of according to local SOP and current regulations.
- Stop the pump immediately and inspect all grounding and bonding connections if you see sparks. Ensure all grounding and bonding connections are making a bare metal-to-metal contact. If you cannot find any faulty connections, look at the power equipment in the area to find the cause of the stray current.
- Stop the transfer operation at once and close the cover of a tank vehicle or the hinged dome of a tank car. If a fire starts at a screw-type dome of a tank car, smother the flames by throwing a wet tarpaulin or blanket over the dome or by spraying the flames with a carbon dioxide or foam fire extinguisher.

• Stop all transfer operations if there is an enemy attack, electrical storm, or fire in the area. Then cut off the flow of fuel to the tank vehicle or tank car, remove the hoses, and move the vehicle or tank car out of the danger zone.

• Use your equipment for handling only one type of product to prevent product contamination. If you have to use the same equipment to handle several products, drain the equipment thoroughly of the product it just handled, and clean it if necessary. In addition, use tank vehicles and tank cars to carry only one type of product. If you must use them for more than one fuel, inspect and clean them well between loads (Military Handbook 200).

• Ensure all electrical equipment you use in the area is explosion proof and in good operating condition.

• Do not permit welding, open flames, or lights (other than approved explosion proof flashlights or lanterns) within 100 feet of any receipt, storage, or issue operation.

• Place drip pans under all locations where leaks or spills may occur. Drip pans should be used when you are connecting or disconnecting hoseline or pipeline couplings. They should also be placed under tank vehicle or tank car loading connections.

SAFETY AND IDENTIFICATION MARKINGS

Mark the products you handle to identify them as shown in ARs 385-30 and 750-58 and MIL-STD-161. You must identify the type of product at each storage point with stenciled marks, decals, or placards. See Chapter 24 for the safety markings required on tank vehicles.

TANK CAR LOADING AND UNLOADING SITE

A number of steps are required to select and prepare the tank car loading and unloading site. These steps are described in Chapter 11.

Section II. Receipt

PRELIMINARY PROCEDURES

Some of the things you must do before you receive bulk petroleum are outlined below. They apply chiefly to tank vehicles and tank cars. If you want to check yourself on tank vehicle and tank car procedures during the actual transfer operation, use the checklist shown in Appendix J. Some of the items on the list, however, do not apply to tactical Class III supply point operations but apply instead to terminal operations. See Chapter 6 for special information on terminals.

Prepare Delivery Schedule

Prepare a delivery schedule to avoid delays and interruptions at the Class III supply point. Before the product arrives, you should be notified of the type and amount of product and the approximate date and time it will arrive. This gives you time to plan for the receipt of the product.

Inspect Receiving Equipment

Inspect pumps, filter/separators, hose, manifolds, valves, and fittings to see that they are clean and in good working condition. Make sure your storage tanks are clean and free of contamination. If you need to clean or repair storage tanks, tank vehicles, or tank cars, see Chapter 12 for details. Also, inspect the storage tanks to see if there is enough ullage in them to receive the incoming shipment. Do these things before the transporter gets to the supply point.

Spot the Transporter

The first thing you do when the transporter arrives at your supply point is to position it so that hose connections can be made. When unloading a number of transporters at the same time, ensure they are at least 25 feet apart. If you are dealing with a tank car, follow the procedures in Chapter 11.

Check Seals and Numbers

After you have the transporter in place, compare the transporter and seal numbers with those on the shipping papers to ensure you have received the right shipment. Look at the seals and locks carefully to see if there are signs of tampering or pilfering. If you find a broken seal or lock, notify the proper authority, but do not use the product until it has been sampled and tested. If the transporter has no seals, you must carefully inspect the product to verify its quality and quantity.

Open Manhole and Dome Covers

When you open the manhole (tank vehicle) or dome cover (tank car), stand on the windward side of the transporter. Clean all dirt and cinders from around the opening. Raise the safety valve or vent valve to see if there is internal pressure in the tank. If there is pressure, reduce it by raising the safety valve or vent valve and keeping it open. Take the cover off slowly to let the remaining pressure escape. If you have a tank car that has a screwed on cover, place a bar between the cover lug and dome knob and unscrew the cover two complete turns or until the vent openings are exposed. If you have a tank car that has a hinge-and-bolt dome cover, loosen the nuts enough to let out the pressure inside the tank.

Measure and Sample Products

After you open the cover, measure and sample the product in the transporter. Gage the tank, make an API gravity test, and take the temperature of the product. Then correct the volume to 60°F according to DA Pam 710-2-2, and record the data. Take a sample, and examine it for color, brightness, and clarity. Look for a cloud, haze, emulsion, or droplets of water on the sides of the sample container. Also, check for accumulated water on the bottom of the container. Cloudy or hazy fuels contain some undissolved water. If you see sediment or suspended foreign matter, you know the product is contaminated.

Inspect the Transporter

Inspect the transporter for leaks through the shell and bottom outlet. If the transporter is leaking, unload the fuel at once. Place a container under the leak, and clean up any spills. Also, ensure that the discharge outlet is in good condition. The valve may stick in cold weather because water from the tank may freeze around it. To free a frozen valve, apply a steam jet, hot water, or hot cloths to the outlet chamber.

TANK VEHICLE UNLOADING

Use the appropriate TM for specific instructions on the operation of tank vehicles. Follow the steps below when you receive bulk petroleum into your Class III supply point from a tank vehicle:

- Ensure the vehicle and the major components in the supply point are bonded and grounded. Place a drainage tub under the discharge manifold of the tank vehicle. Do not forget that you also need a fire extinguisher near the receiving point. Be sure to follow all the safety precautions.

- Connect the suction hose to the discharge port of the vehicle. Then assign someone to the top of the tank vehicle to watch the level of fuel as the product is discharged from the vehicle. Ensure that the manhole covers stay open during the receipt operation. Do this so that the tank shell does not collapse in case of a vent failure.

- Open the discharge valves on the tank vehicle and the suction valve on the 350-GPM pumping assembly in the FSSP. Then start the pump and idle it for three to five minutes.

- Open the manifold valves of the collapsible tank that will receive the product. Ensure your tanks have enough ullage to receive the shipment. Also, ensure all the other valves between the collapsible tank and the tank vehicle are open.

- Open the discharge valve on the pumping assembly, and increase the speed on the pump to operating speed. Continue this pump speed until you empty the tank vehicle. Figure 28-1, page 28-5, shows the product moving through the FSSP.

- Idle the pump back for about three to five minutes before you shut it off. Close the discharge valve on the pump and the manifold valves of the storage tank. Then close the gravity discharge valve on the tank vehicle and the suction valve on the pump.

- Uncouple the suction hose from the tank vehicle, close the manhole covers, and disconnect the bonding and grounding equipment. Then move the tank vehicle from the receiving point, and get ready to unload the next vehicle.

TANK CAR UNLOADING THROUGH THE BOTTOM OUTLET

Always unload a tank car through the bottom outlet. However, if the bottom outlet is broken or you do not have the necessary adapter fittings, unload the tank car through the dome. No matter how you unload the car, always follow applicable safety precautions and the preliminary procedures discussed previously. Follow the steps listed in Chapter 11 to unload tank cars through the bottom outlet.

TANK CAR UNLOADING THROUGH THE DOME

The procedures for unloading a tank car through the dome are almost the same as those for unloading through the bottom outlet. You pump the fuel the same way, and your preliminary, safety, and follow-up procedures are the same. The only difference is that you place the suction hose through the dome instead of connecting it to the bottom outlet. When you put the suction hose through the dome, ensure it touches the bottom of the tank. Keep the hose below the surface of the product until you finish unloading the tank. Be sure never to let air under pressure into a tank car when you are unloading by displacement. When the tank car is almost empty, move the hose around so that you draw all the product from the car. If possible, remove the bottom outlet cap and drain the product from the outlet chamber.

RECEIPT OF PRODUCT THROUGH THE ASSAULT HOSELINE

The assault hoseline is usually connected to the discharge hose of the 350-GPM pumping assembly on the receiving side of the FSSP as shown in Figure 28-2, page 28-6. With this setup, the assault hoseline bypasses the receiving pump. Also, you can connect the assault hoseline to a 50,000-gallon collapsible tank with this setup. See Chapter 27 for facts on how to set up, operate, and displace the assault hoseline. Follow the steps below to receive bulk petroleum into the FSSP through the assault hoseline:

- Ensure you have good communications with the upstream pumping stations. You must keep in close touch during hoseline operations to prevent accidents such as overfilled or ruptured tanks.

- Ensure you have enough ullage in your storage tanks to handle the incoming shipment after you receive a pumping order. It tells you how much product will be delivered to the supply point. Then check your pumps, filter/separators, hose, manifolds, valves, and fittings to ensure they are clean and in good working condition. Also, ensure that the major items of equipment in the supply point are grounded and bonded.

- Open the manifold valves on the collapsible tank that will receive the product. Make sure all the other valves between the collapsible tank and the hoseline are open. Then open the mainline valve on the assault hoseline.

- Tell the upstream pumping station that you are ready to receive the product. Once the products start to flow, have some crew members walk the length of the hoseline to look for leaks in the hose, fittings, and valves.

- Transfer product to a number of storage tanks if you have a large shipment. To do this, first open the manifold valves on an empty storage tank and then close the manifold valves on the tank that has just been filled. Keep doing this until the entire shipment has arrived.

- Tell the upstream pumping station to reduce the flow rate when you have received almost all of the shipment or when you are filling the last storage tank. Then gradually shut down the hoseline. You must keep in close touch with the pumping station so as to keep from overfilling or rupturing a storage tank.

- Close all valves in the FSSP after the shipping order is complete. Then shut off the main valve on the assault hoseline.

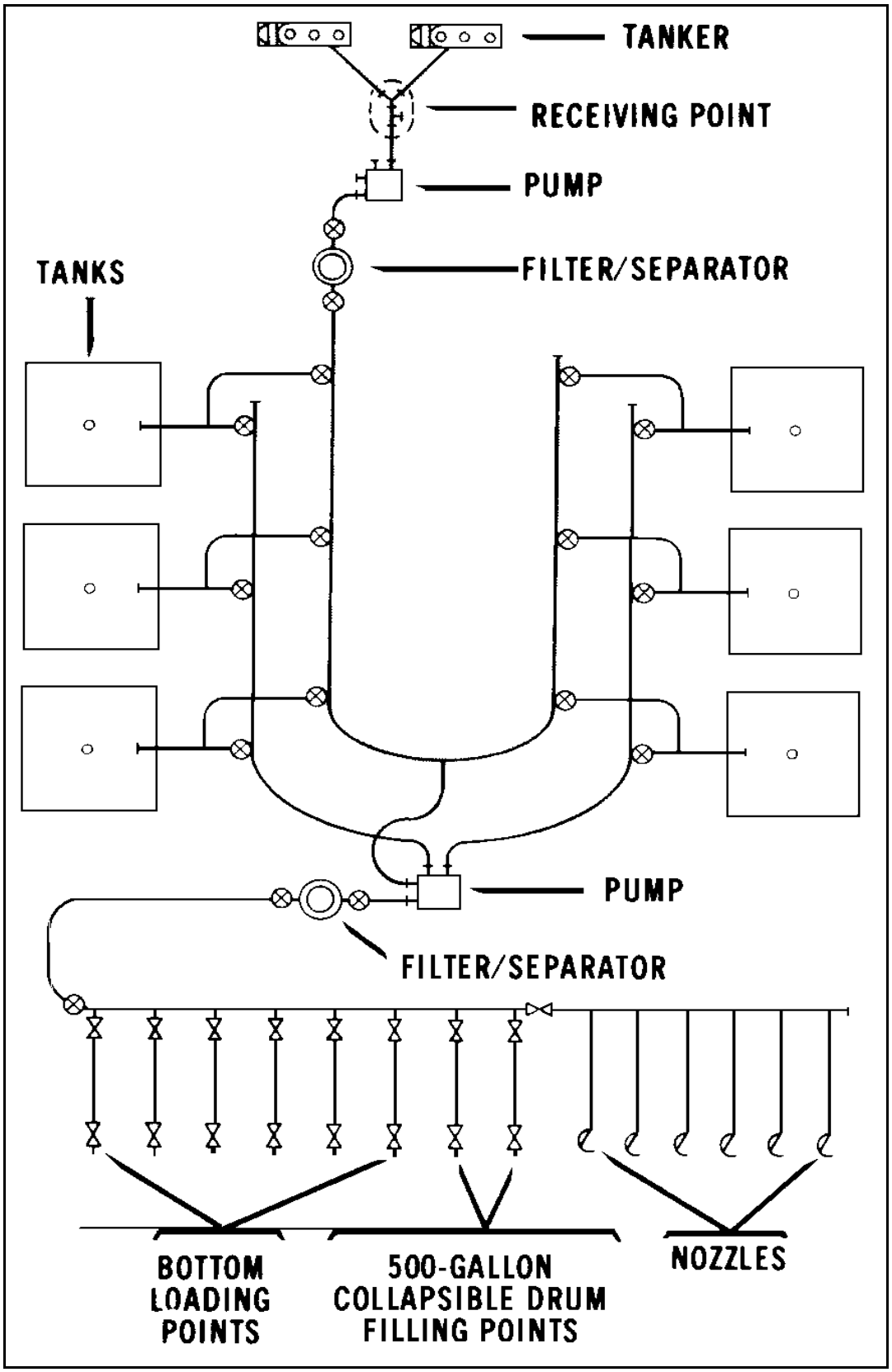
TANKER
RECEIVING POINT
PUMP
TANKS
FILTER/SEPARATOR
PUMP
FILTER/SEPARATOR
BOTTOM LOADING POINTS
500-GALLON COLLAPSIBLE DRUM FILLING POINTS
NOZZLES

Figure 28-1.Receiving product into the FSSP from tank vehicles

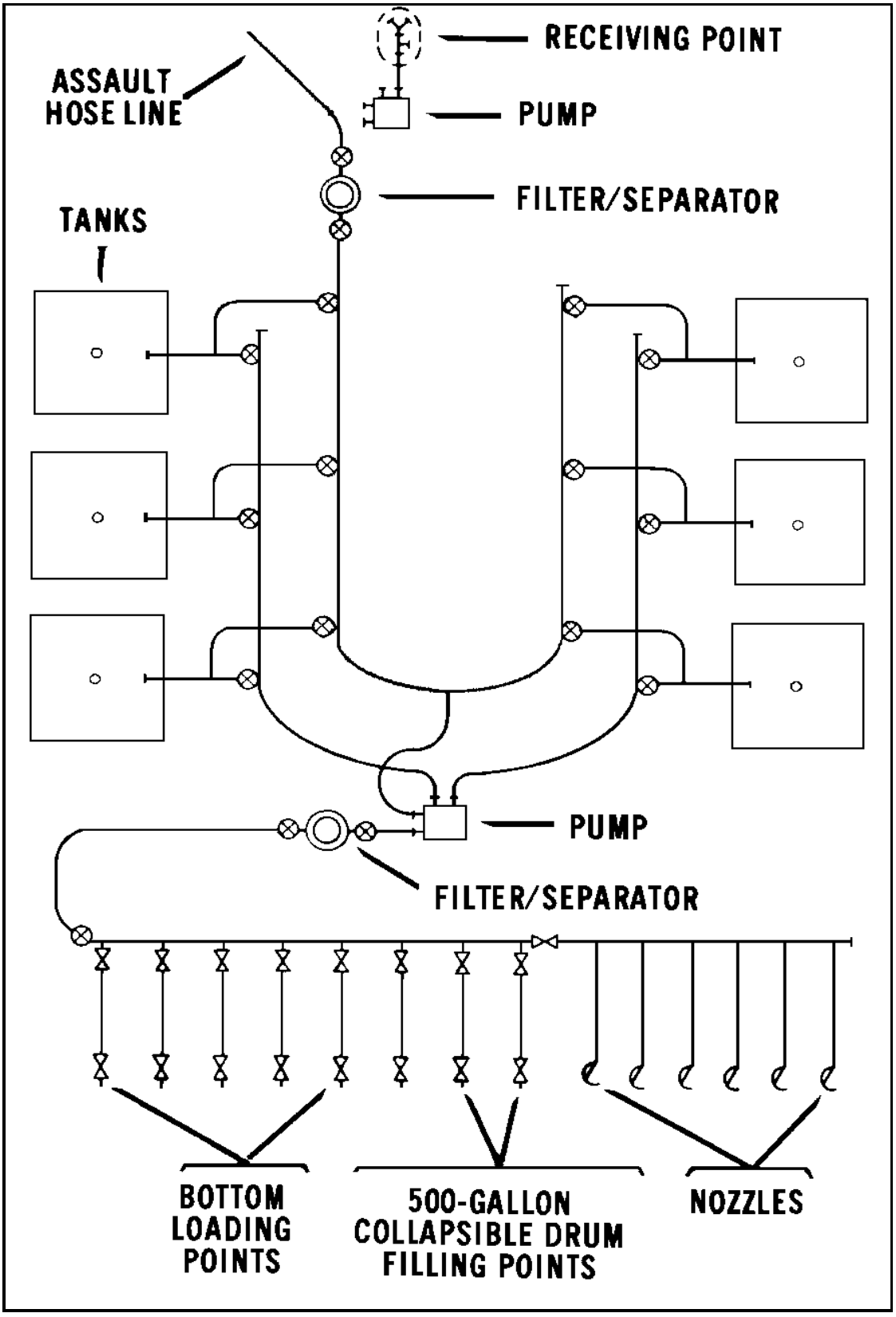

Figure 28-2. Receiving product into the FSSP through the assault hose line

Section III. Storage

STORAGE CONSIDERATIONS

At the tactical Class III supply point, you should always store bulk petroleum in collapsible tanks. If you are in a supply section of a petroleum supply company, you can store up to 420,000 gallons of bulk petroleum (120,000 gallons in the FSSP and 300,000 gallons in the six 50,000-gallon collapsible tanks). But storage is much more than putting product in a tank. It involves such things as inspections, product circulation, tank repair, and even the disposal of excess product. The storage of bulk petroleum can be as dangerous as its receipt and issue, so always follow applicable procedures.

STORAGE PRACTICES

There a number of practices you should always follow when storing bulk petroleum. These practices are listed below.

- Make sure you have a separate handling system for each type of petroleum product you store. Never mix various fuels together, and never mix leaded and unleaded gasoline.
- Install a filter/separator in the supply line between the storage tanks and the dispensing points.
- Do not store your hoses in a way that will bend them sharply over brackets. Do not leave hoses lying on the ground where vehicles may run over them. In addition, put dust caps and plugs on all hoses when they are not in use.
- Drain any water in your collapsible tanks through the drain fitting assembly.
- Clean line strainers and nozzle screens each day. When you remove the screen in a pressure nozzle, first disconnect the adapter. If you find any damaged strainers or screens, repair or replace them at once.
- If you find any particles of rubber or lint in a screen, it may show that the hose is deteriorating. Sediment, scale, or rust in the nozzle screen may show the failure of a filter element.
- Put dust caps on all nozzles when you are not using them. This keeps dust, dirt, and sediment from entering the nozzle spout and contaminating the fuel.
- Run a string across the top of your collapsible tanks so that you do not overfill them. Put the string 4 feet off the ground for 3,000- and 10,000-gallon collapsible tanks. When the top of the tank reaches the string, it means the tank is full.
- Follow the first-in, first-out rule so that products do not deteriorate due to prolonged storage. Issue packaged products in damaged containers first, regardless of age.
- Inspect your facilities and operations regularly. Keep records of inspections, tests, checks, tank cleaning, and maintenance. Follow up on deficiencies to ensure they are corrected.
- Keep equipment records on the items in the supply point. Use DD Form 1970 to record and control the use of equipment when you do not use the equipment logbook for this purpose. Use DA Form 2404 to record inspections and service before, during, and after use of equipment. DA Pamphlet 738-750 has more information on the use and preparation of these records.

INSPECTIONS

Inspections are the key to finding out how well your Class III supply point is performing. They give you firsthand information on how the equipment and products are maintained from day to day. Inspections let you make on-the-spot corrections. They also give you information on the availability of required publications, accuracy of supply records and procedures, supply economy practices, care of tools and equipment, and status of authorized stock levels of equipment and repair parts. Follow the steps below when inspecting your Class III supply point:

- Inspect the collapsible tanks and hoses in your supply point each day for signs of leaks, tears, punctures, unusual wear, and fabric deterioration.

- Inspect the operating equipment in the supply point daily to evaluate operator maintenance and ensure that the equipment is in good working order.
- Inspect fire-fighting equipment and drainage facilities weekly to see that they are in good condition. Make sure that the storage area is free of trash, weeds, or other combustible material.
- Survey the traffic control system often to ensure that traffic is routed efficiently. See that there is no unnecessary equipment in the area to hinder traffic movement or access to fire fighting-equipment.

FILTER/SEPARATORS

Filter/separators help you keep the product clean and water-free at the Class III supply point. The steps you should take to keep your filter/separators in good condition are outlined in Chapter 21.

PRODUCT CONSOLIDATION AND CIRCULATION

When you consolidate or circulate product, you simply move it from one storage tank in the supply point to another. You should consolidate your stock so that several storage tanks are filled with product and several are empty. This way you can be ready to receive and issue large quantities of bulk petroleum on short notice. You also cut down on the number of tank switches you have to make during receipt and issue. Circulate the stock in your supply point so that the heavier portions of the product do not settle to the bottom of the tank and the light ends do not come to the top. Also, circulation ensures a good mixture of all the additives in the fuel. Step-by-step procedures for consolidating fuel at that FSSP are given below:

- Ensure the equipment in the FSSP is grounded. Then open the manifold valves on the collapsible tank from which you are transferring product.
- Open the suction valve on the 350-GPM pumping assembly and the manifold valves on the collapsible tank that will receive the product. Ensure all the other valves between the two collapsible tanks are open. Make your daily preventive maintenance checks on the pump. Then start the pump, and idle it for three to five minutes.
- Open the discharge valve on the pump, and increase the pump speed to the operating level. Continue pumping this way until you have finished the transfer. Figure 28-3, page 28-11, shows the product moving through the FSSP.
- Idle the pump back for three to five minutes before you shut it off. Close the discharge valve on the pump and the manifold valves on the collapsible tanks while the pump is idling. Then close the suction valve on the pump.

EMERGENCY TANK REPAIR

If any of the collapsible tanks develop a leak, repair them at once with emergency repair items. Chapter 12 covers tank repairs.

DISPOSAL OF EXCESS

If you are in CONUS or an overseas activity and you have an excess in bulk or packaged fuels of 500 gallons or more per product grade, report the excess by sending a message to the Commander, USAPC. Include in your message the quantity, location, type of product, NSN, and latest laboratory test results. If you are in an overseas command, also report the excess to the appropriate DFSC field office or the JPO.

Section IV. Issue

ISSUE CONSIDERATIONS

Issuing bulk petroleum is perhaps the most important responsibility you have at the Class III supply point. The reason you are in the field is to get large quantities of petroleum to the units you support. In the theater of operations, you issue liquid petroleum in bulk as far forward as the tactical situation permits. Usually the units you support pick up bulk petroleum from the supply point in their own vehicles. When you use the FSSP, make

your bulk issues from the bottom loading points. Step-by-step procedures for issuing bulk petroleum to tank vehicles and tank cars are discussed in this section.

PRELIMINARY PROCEDURES

There are a number of preliminary steps you should take before issuing bulk petroleum from your Class III supply point. These steps are discussed below.

Prepare Issue Schedule

Prepare an issue schedule before any transporter arrives at the supply point. Start by telling your customer how much and what type of product you have on hand. Then tell him when he can pick up product at the supply point. If your transporters are delivering the product, tell the customer when it will arrive at his supply point. Try to avoid delays and interruptions when you are scheduling issues. In other words, do not have more transporters at your supply point than you can handle at one time. Also, ensure you have enough product on hand to fill all your orders.

Inspect Equipment

Ensure that the discharging equipment in the supply point is in good working condition. Inspect your pumps, filter/separators, collapsible tanks, hose manifolds, valves, and fittings daily to see that they are free of leaks and contaminations.

Spot the Transporter

When the transporter arrives at the supply point, check the customer's issue request to ensure it is properly authorized. Then position the transporter at an issue point.

Inspect the Transporter

Open the manhole or dome cover to inspect the transporter. As part of your inspection, do the following:

- Check the inside and outside of the tank for holes, cracks, or loose plates. Ensure there are no leaks in the tank. See that the tank is properly mounted to the frame and safe for the road.
- Inspect the inside of the tank to see if it is clean. If you see a residue on the bottom of the tank such as rust, sand, or dirt, reject the transporter and have it cleaned according to directions in Chapter 13. Let only authorized personnel, familiar with tank-cleaning procedures and safeguards, enter the tank.
- Check the interior of the tank for foreign objects such as tools, bolts, or old seals. Have authorized personnel remove objects from the tank. Some objects do not contaminate the product, but they may damage valves. Also, look for residual product in the tank. If you see any, remove it before you fill the tank.
- Inspect the fuel delivery system of the transporter for damage. On tank cars, check the dome, dome cover, bottom outlet chamber, and safety valve to ensure they are in good condition. See that the vent holes in the dome cover are open and free of dirt.
- Ensure the tank car outlet valve seats and seals properly. To do this, first place a drainage tub under the bottom outlet chamber. Then open and close the outlet valve several times by working the valve rod handle or handwheel located inside the dome. If the valve does not seat properly, reject the car and report the malfunction to the local transportation officer who will schedule the repair. However, you may load the tank car in an emergency without repairing the valve, but report the broken valve to the unit receiving the tank car so that they can unload it through the dome. In any case, the tank car should be scheduled for repair as soon as possible. Ensure the outlet valve is closed after you have checked it.
- Ensure the product last carried in the tank is the same as the product you are going to put in it. If it is not, follow the procedures in MIL-HDBK-200. If you think it is necessary, flush the tank of the transporter with a small amount of product to remove any traces of the last product as well as rust and scale. Then collect this product and put it in a waste container. Appendix K has a conversion chart for procedures that should be followed when changing products in tank cars and tank trucks.

TANK VEHICLE LOADING

Bulk petroleum can be issued to tank vehicles from your Class III supply point. Before you start, look over the applicable safety precautions and the preliminary procedures previously described. See the appropriate TM for detailed information on the operation of tank vehicles. Follow the steps below to issue bulk petroleum to tank vehicles from your Class III supply point:

- Ensure the vehicle and all issue equipment are bonded and grounded. Place a fire extinguisher at the issue point and a drainage tub under the receiving manifold of the tank vehicle.
- Connect the discharge hose to the receiving port of the tank vehicle. If the vehicle does not have an automatic shutoff, assign someone to the top of the tank body to watch the product as it comes into the tank so that you do not overfill the vehicle.
- Make your preventive maintenance checks on the 350-GPM pump. Open the receiving valves on the tank vehicle and the manifold valves on the collapsible tank supplying the product. Ensure all the other valves between the collapsible tank and the tank vehicle are open. Then open the suction valve on the 350-GPM pumping assembly. Start the pump, and idle it for three to five minutes.
- Open the discharge valve on the pump, and increase its speed to operating speed. Pump at this rate until the tank vehicle is about three-fourths full. Then reduce the speed of the pump, and finish filling the tank at this rate. Figure 28-4, page 28-12, shows the product moving through the FSSP and into the tank vehicle.
- Idle the pump back for about three to five minutes when you have filled the tank and before you shut it off.
- Quickly turn off the system. Start by closing the pump discharge valve and the tank vehicle receiving valve. Then close the manifold valves on the collapsible tank and the suction valve on the pump. The last step is to uncouple the discharge hose from the tank vehicle.
- Close the manhole cover, and move the vehicle to the designated area.
- Let the product stand for about 15 minutes so that suspended water or sediment can fall to the bottom of the tank. Then measure and sample the product in the transporter. Gage the tank, make an API gravity test, and take the temperature of the product. Then correct the volume to 60°F, and record the data. Take a sample, and examine it for color and appearance.
- Close the manhole covers, and remove the drainage tub. Then disconnect the bonding and grounding equipment.

TANK CAR LOADING THROUGH THE BOTTOM OUTLET

Always load a tank car through the bottom outlet unless the bottom outlet is broken or you do not have the adapter fittings you need. When this is the case, load the tank through the dome. Loading through the bottom outlet is by far the better way because it prevents vapor loss, reduces static electricity, and protects the fuel against contamination from outside sources. Before you start loading, take the appropriate safety precautions and perform the necessary preliminary procedures. Then follow the steps in Chapter 12.

TANK CAR LOADING THROUGH THE DOME

Tank cars should be loaded through the dome only when bottom loading is not possible. Top loading must be approved by the first commander in line. The procedures for loading a tank car through the dome are almost the same as those for loading through the bottom outlet. You operate the pump in the same way and perform the same preliminary, safety, and follow-up procedures. The only difference is that you place the discharge hose in the dome instead of connecting it to the bottom outlet. Follow the steps in Chapter 12.

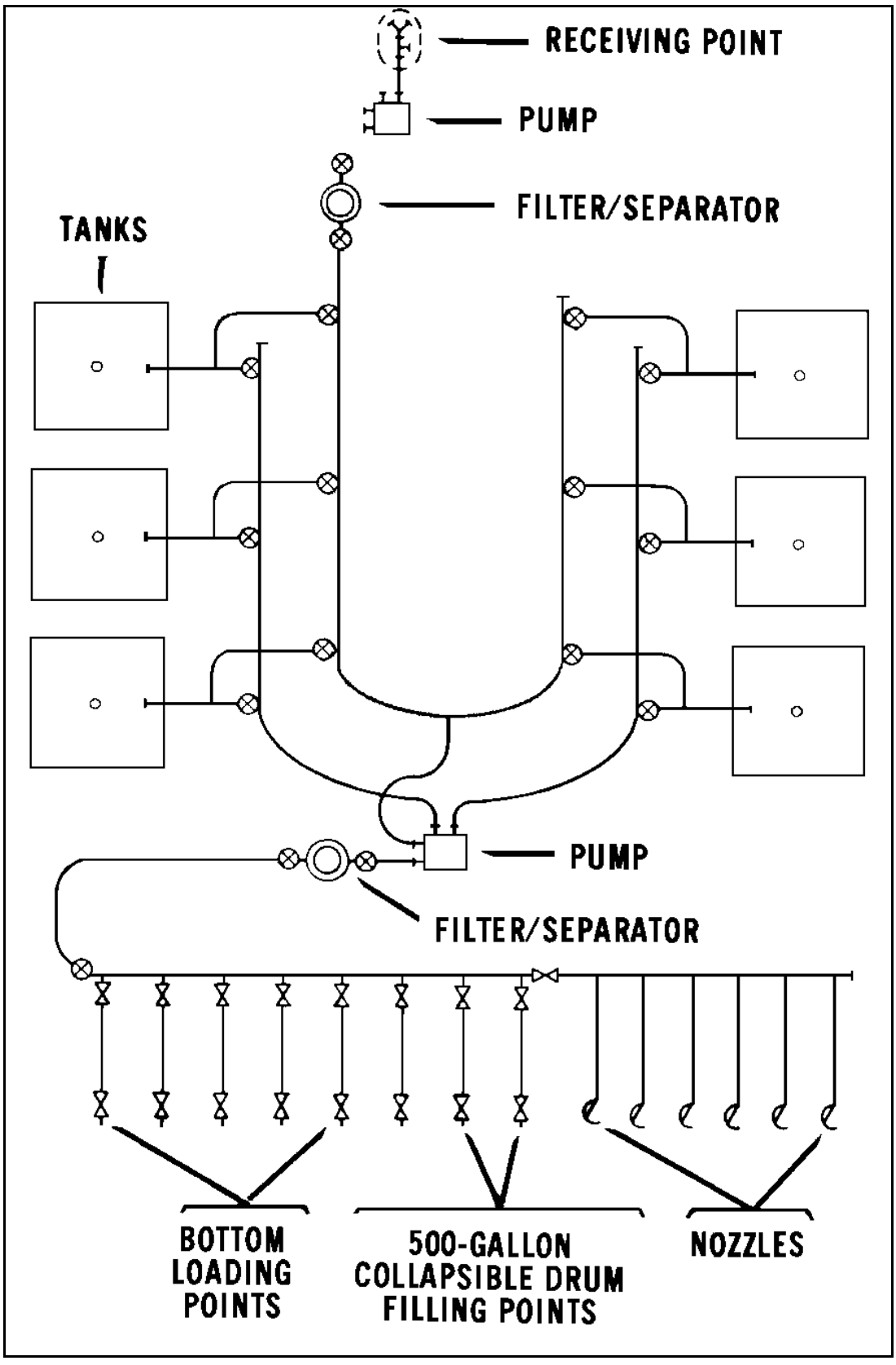

Figure 28-3. Consolidating or cirulating product in the FSSP

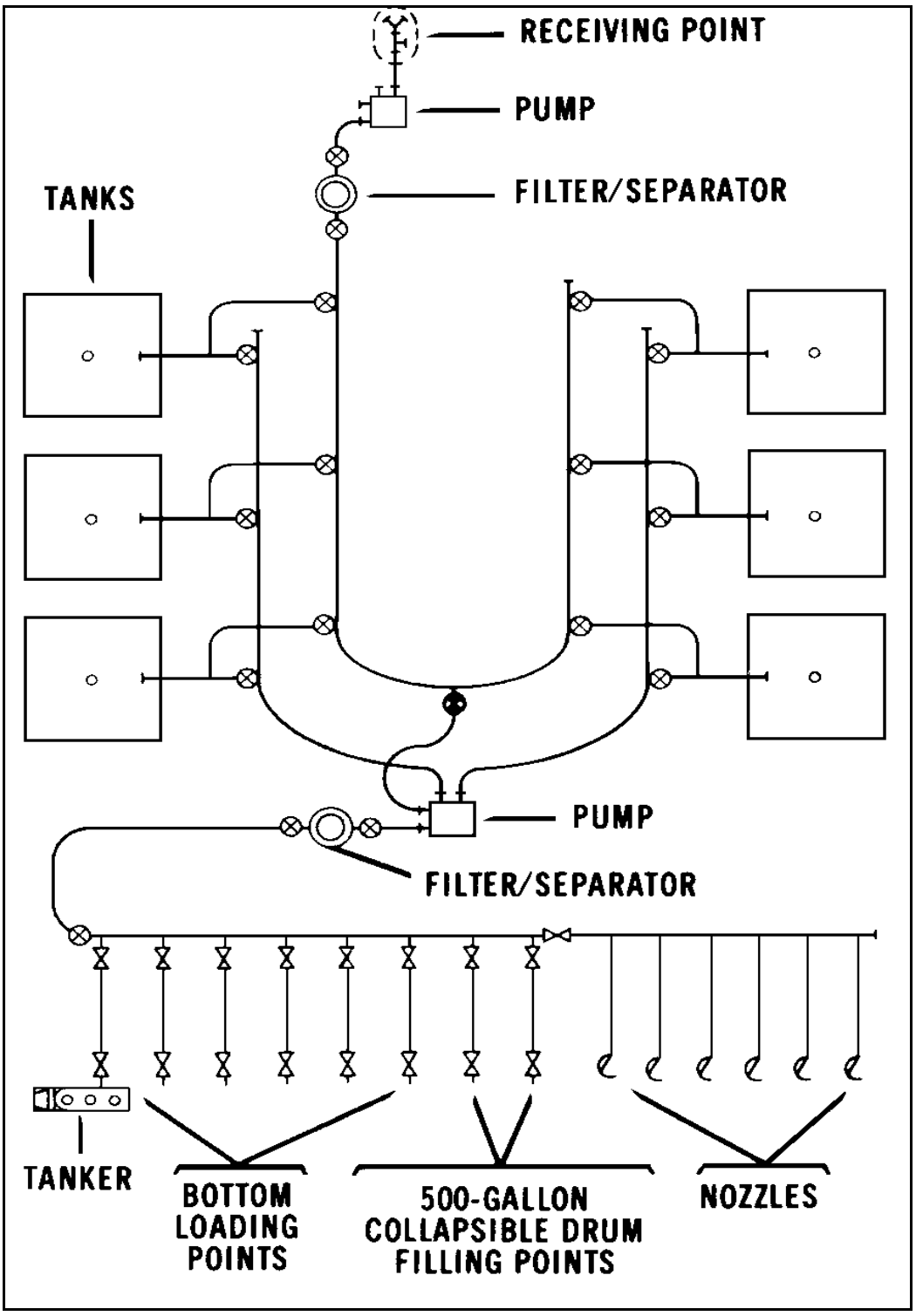

Figure 28-4. Issuing product from an FSSP to a tank vehicle